CHEVRON DEX-COOL® EXTENDED LIFE ANTIFREEZE/COOLANT
Concentrate and Prediluted 50/50 (with and without Bitterant)

CUSTOMER BENEFITS

Chevron DEX-COOL® Extended Life Antifreeze/Coolant delivers value through:

- **Meets GM 6277M** — GM's new Long Life Coolant specification
- **5 year or 150,000 mile service interval**
- **Provides effective, long term corrosion protection** for aluminum, brass, cast iron, steel, solder and copper
- **Protects against winter freeze up and minimizes the chance of summer boil over**
- **Compatible with water pump seal materials** and minimizes the formation of abrasive dissolved solids
- **Stable for at least eight years storage**
- **No silicate dropout or gel formation** during use or storage
- **100% biodegradable** in its pure unused form
- **Excellent heat transfer** properties
- **Nitrite-, borate-, phosphate-, nitrate- and amine-free**
- **Outstanding hot surface** aluminum protection
- **Superior protection** in high operating temperatures
- **Compatible with conventional antifreeze**. Dilution beyond 25% with non-Chevron DEX-COOL formulation products will reduce extended life benefits.

FEATURES

Chevron DEX-COOL Extended Life Antifreeze/Coolant is a single-phase, ethylene glycol type universal automotive engine coolant based on a Chevron's patented long life organic corrosion inhibitor system. It is a nitrite-, nitrate-, phosphate-, silicate-, borate and amine-free formulation which uses Chevron's patented carboxylate technology to provide maximum protection of the six basic metal alloys found in most heat transfer systems. This inhibitor system eliminates the need for silicates, phosphates, borates, nitrites, nitrates and amine additives traditionally used for this purpose.

Replacing these inhibitors is significant for water pump life because many of these conventional inhibitors have been shown to be abrasive to water pump seals. In comparison field tests with conventional coolants in taxi fleets, Chevron DEX-COOL Extended Life Antifreeze/Coolant significantly reduced the need to replace water pumps during the 100,000 mile test. In addition to fleet tests, this product has also been tested by a major manufacturer of water pump seals, and has been found to be more compatible with the seals than any other coolant tested.

Since the coolant contains no phosphates or silicates, hard water deposits in the cooling system are almost eliminated. The low level of abrasive dissolved solids in Chevron DEX-COOL Extended Life Antifreeze/Coolant results in improved water pump seal life.

The life of a coolant in an automobile engine is limited by the corrosion protection ability of the corrosion inhibitors. The main corrosion inhibitors in Chevron DEX-COOL Extended Life Antifreeze/Coolant have been shown to remain above 95% of their original concentration after 150,000 miles in automobiles. This allows much longer intervals between coolant changes without worrying about loss of corrosion protection.

Chevron DEX-COOL Extended Life **Prediluted 50/50** Antifreeze/Coolant is a 50/50 mixture of Chevron DEX-COOL Extended Life Antifreeze/Coolant with deionized water.

APPLICATIONS

Chevron DEX-COOL Extended Life Antifreeze/Coolant is recommended for use in the cooling systems of all types of automotive engines.

Chevron DEX-COOL Extended Life Antifreeze/Coolant meets:

- ASTM D 3306 for automotive service
- ASTM D 4985 for heavy-duty diesel service.

Chevron DEX-COOL Extended Life **Prediluted 50/50** Antifreeze/Coolant meets:

- ASTM D 4656 for automotive preblend
- ASTM D 5345 for heavy-duty preblend.

For optimum year round protection against freezing, boiling, and corrosion, a 50 percent Chevron DEX-COOL Extended Life Antifreeze/Coolant solution (1 part antifreeze/1 part water) is recommended. For maximum protection against freezing in extremely cold areas, a 60 percent solution (3 parts antifreeze/2 parts water) can be used. Concentrations greater than 67 percent or less than 40 percent are not recommended. Chevron DEX-COOL Prediluted 50/50 is recommended for use as purchased.

Note: These products are not to be used to protect the inside of potable water systems against freezing.

Recommended Dilutions for Chevron DEX-COOL Extended Life Antifreeze/Coolant

Boiling Protection	**°C(°F)***
50% 1:1 (1 part antifreeze/1 part water)	129.4(265)

* using a 15lb pressure cap

Freezing Protection	**°C(°F)**
40% 2:3 (2 parts antifreeze/3 parts water)	-24.4(-12)
50% 1:1 (1 part antifreeze/1 part water)	-36.7(-34)
60% 3:2 (3 parts antifreeze/2 parts water)	-52.2(-62)

Chevron recommends that this product not be diluted by more than 25% with non- Chevron DEX-COOL formulation products.

Chevron DEX-COOL Extended Life **Prediluted 50/50** Antifreeze/Coolant should be used as manufactured. No dilution is recommended.

CORROSION PROTECTION

Used Chevron DEX-COOL Extended Life Antifreeze/Coolant was tested in laboratory controlled corrosion tests for new coolants after it had already been in service for more than 100,000 miles. The used Chevron DEX-COOL Extended Life Antifreeze/Coolant passed the ASTM D 1384 requirements for glassware corrosion with results equivalent to new coolants and also passed the ASTM D 4340 Aluminum Hot Surface Test for new coolant. Chevron DEX-COOL Extended Life Antifreeze/Coolant represents the next generation of universal engine coolants. This coolant is suitable for a five year or 150,000 miles service life in automotive applications.

Chevron DEX-COOL Extended Life Antifreeze/Coolant and Prediluted 50/50 have been tested against all ASTM standards for heavy duty and light duty coolants. In ASTM 1384, Glassware Corrosion test, the inhibitor system rendered weight losses that were only a small fraction of allowed limits for all six metals tested.

Chevron DEX-COOL Extended Life Antifreeze/Coolant ASTM D 1384 Glassware Corrosion Test

	ASTM Limit	Weight loss, mg per coupon*
Copper	10 max	2
Solder	30 max	-2
Brass	10 max	2
Steel	10 max	-1
Iron	10 max	-3
Aluminum	30 max	4

* Negative indicates net gain

Traditional phosphate and borate containing coolants exhibit high pH and reserve alkalinity (RA[1]) when compared with Chevron DEX-COOL Extended Life Antifreeze/Coolant. This comparison can not be used to make conclusions about relative corrosion protection since the definition of RA is based upon the buffering curve of inhibitors that are not present in the coolant. Its unique corrosion inhibitor system is designed to protect aluminum and other system metals at lower pH levels than conventional coolants.

A comparison of Chevron's extended life coolant with traditional coolants is shown below:

	Chevron DEX-COOL Extended Life Antifreeze/Coolant	**Traditional antifreeze/coolant**
Typical pH	8.3	10.5
Typical RA (mL)	6.0	12.0

This long life coolant has low pH and RA relative to traditional coolants. The pH change profile in service is a more important performance measure than the RA level. Chevron DEX-COOL Extended Life Antifreeze/Coolant shows a typical pH reduction of less than 1.5 units in 100,000-mile fleet tests compared with a pH reduction of up to 3 units for traditional coolants.

1. RA is defined as the amount, in milliliters (mL), of 0.1 normal hydrochloric acid required to reduce the pH of 10 ml of antifreeze to 5.5.

The American Society for Testing Materials (ASTM) has eliminated minimum RA Level requirements in both key antifreeze specifications: ASTM D 3306 for automotive and ASTM D 4985 for heavy-duty engines. This action by the ASTM acknowledges that coolants that are not based on phosphate and borate can provide excellent corrosion protection for cooling system metals.

HANDLING PRACTICES

The primary limiting factor in the shelf life of a coolant is silicate instability. Since silicate will eventually polymerize to silicate gel, all traditional coolants have a shelf life of about 18 months. Chevron DEX-COOL Extended Life Antifreeze/Coolant is silicate-free and therefore can be stored for at least 8 years without a problem, provided the integrity of the container is maintained.

Always dispose of used coolant in accordance with local, state, and federal guidelines.

For information on the safe handling and use of these products, refer to their Material Safety Data Sheets. For more information and availability, call 1-866-688-8890

TYPICAL TEST DATA

Chevron DEX-COOL Extended Life Antifreeze/ Coolant with and without Bitterant

	with Bitterant	without Bitterant
Product Number	*227807*	*227802*
MSDS Number	*10444*	*10727*
Appearance	Orange	Orange
Specific gravity 15/15 °C	1.130	1.130
Freezing point, °C[1], ASTM D 1177	-36.7	-36.7
pH[2], ASTM D 1287	8.3	8.3
Reserve alkalinity[3], ASTM D 1121	6.0	6.0
Silicate, %[4]	None	None

Typical test data are average values only. Minor variations which do not affect product performance are to be expected in normal manufacturing.

1 50 vol % aqueous solution
2 1:2 dilution with water
3 as received
4 as anhydrous alkali metasilicate

Chevron DEX-COOL Extended Life Prediluted 50/50 Antifreeze/Coolant, with and without Bitterant

	with Bitterant	without Bitterant
Product Number	*227810*	*227803*
MSDS Number	*10445*	*10729*